

## **CHAPTER-1**

### **THEORETICAL OF BANK EFFICIENCY**

1.Bhadrappa Haralayya  
Post Doctoral Fellowship Research Scholar,  
Srinivas University, Mangalore, India.  
[bhadrappabhavimani@gmail.com](mailto:bhadrappabhavimani@gmail.com)  
Orcid id-0000-0003-3214-7261

2.P. S. Aithal,  
Professor, College of Management and Commerce,  
Srinivas University, Mangalore, India.  
[psaithal@gmail.com](mailto:psaithal@gmail.com)  
Orcid id-0000-0002-4691-8736

#### **ABSTRACT**

Since the time of bondage and feudalism, the world has watched progressed innovative and authoritative advancement, which caused increment in the productivity of financial associations. As per Wilkin (1997), acknowledgment of financial proficiency as a key basis of monetary valuation can be followed to represent ants of traditional financial aspects, for the most part Adam Smith and in addition represent ants of exemplary utilitarianism, including John Stuart Mill and Jeremy Bentham who advanced progressivism and independence. Financial radicalism advocates free enterprise private enterprise, liberal standards of basic leadership and underlines the significance of firm proficiency. These thoughts were acknowledged by neo-pragmatist hypotheses with exceptional commitment of Ludwig von Misses and Friedrich A. von Hayek. Proficiency has regularly been related to profitability. Adam Smith in his popular book "An Inquiry into the Nature and Causes of the Wealth of Nations" expresses that the division of work will give the best enhancement in profitability and specialist's ability. Increment in the efficiency of work, as indicated by Smith, was inferable from the sparing of the work time and to the innovation of an incredible number of machines which encourage and abbreviate work and empower one man to take every necessary step of many (Bremond et al., 2015).

Key words: Parametric approach, Non-parametric approach

## 1.1 INTRODUCTION

Marx drew a sharp qualification between the profitability of work as far as physical yields created, and the esteem or cost of those yields. He dismissed the likelihood of an idea of profitability that would be totally impartial and fair by the interests of various social classes. As indicated by Marxists, efficiency development without synchronous wage rise builds the extraction of surplus incentive from the common laborers. Aside from previously mentioned hypotheses, the attention on financial proficiency was additionally given by welfare financial aspects, which endeavors to augment social welfare by looking at the monetary exercises of the people. The principal crucial hypothesis of this hypothesis was that focused markets are effective and lead to an exceptional and ideal portion of assets (allocative productivity). Pareto proficiency as a proportion of social welfare was utilized by numerous researchers as their productivity objective. As indicated by this measure, a circumstance was ideal just if no people can be improved off without exacerbating another person off. Opposite, circumstances are considered to have distributive proficiency when products are disseminated to those people who can pick up the most utility from them. Perusing of Samuelson and Nordhaus (2012) affirms that challenge of the market component guarantees proficiency and everybody's welfare. They concede, notwithstanding, that an ideal and completely proficient focused system has never existed and never will.

In the literature taking a gander at banks there is a wide scope of definitions of productivity. The term is drawn closer from different points. Productivity is investigated from the purpose of financial hypothesis and association hypothesis. As indicated by Stepien (2014), it is conceivable to explore proficiency at the dimension of bank or its authoritative units and for specific bank's exercises. Unadulterated financial idea of productivity accept that proficiency is the proportion of aggregate yield merchandise as for information assets. Effectiveness is respected to be higher with larger amount of this proportion. Rose (2012) characterizes proficiency as a marker demonstrating the capacity of bank directors and its staff to keep the rate of increment in incomes and pay at the dimension that surpasses the rate of increment in operational expenses. As indicated by Jaworski (2016), effective exercises are those exercises which lead to accomplishing proposed objectives as well as guarantee financial benefits higher than information sources.

In the literature diverse methods have been utilized to evaluate productivity. Most business analysts by and large acknowledge the rule of normal conduct and break down banks using the neo-traditional

hypothesis of the firm. Such approach makes conceivable to utilize traditional financial proportions of effectiveness (inputs, yields, cost imperatives, and so forth.). Be that as it may, actually banks work under vulnerability and flawed data. This proposes banks ought not be surveyed based on traditional effectiveness estimates alone and that evaluating their general execution requires evaluating both productivity and risk factors. Banks system objective ought to be risk-balanced benefit expansion.

As of late, different effectiveness measures assessed could be comprehensively arranged under two sorts of approaches – parametric and non-parametric approach.

## **1.2 PARAMETRIC:**

There are three primary parametric approaches in the estimation of best practice wilderness as clarified beneath:

I) Stochastic wilderness approach: This method was first created by Farrell (2012) and the stochastic generation outskirts was later created by Afriat (2009) and Aigner et al., (2011).

Later re-understandings have originated from Ferrier and Lovell (2013) and Fried et al., (2012). The outskirts are determined in respect to the capacity being evaluated, which could be the creation, cost or benefit work. The point was to find the base or most extreme capacity, given the dimension of yield and info costs. In this approach, cost, benefit or creation elements of the most effective makers were assessed and an organization's deviation from the boondocks includes two parts, an irregular blunder and a wastefulness term. The piece of the blunder term which speaks to deviations from the boondocks was thought to be drawn from a two-sided circulation, while the wastefulness was thought to be drawn from an uneven appropriation, since wastefulness builds cost. The stochastic wilderness approach can be evaluated utilizing cross-sectional information.

ii) Distribution free approach: The dissemination free approach (DFA) was created by Berger et al., (2012). Under this approach, productivity contrasts are thought to be steady after some time, yet no explicit distributional suspicions are required (Goddard, Molyneux and Wison, 2011). The gauge of wastefulness for each firm was the distinction between its normal lingering and the normal remaining of the firm on the outskirts, with some truncation performed to represent the disappointment of the arbitrary segment to average out to zero. Estimation through appropriation free approach demonstrate requires board informational index.

iii) Thick wilderness approach: The thick boondocks system (TFA) created by Berger and Humphrey (2012) proposes an a lot less difficult division which accept deviations from anticipated expenses inside the most reduced normal cost quartile of banks in a size class speaking to arbitrary blunder. Deviations in anticipated expenses between the most elevated and least quartile speak to gainful wasteful aspects (Goddard, Molyneux and Wison, 2012). This approach forces no distributional presumptions on either the wasteful aspects or the arbitrary mistake. The TFA itself does not give correct point evaluations of productivity for individual firms, yet provides a gauge of the general dimension of effectiveness.

### **1.3 NON-PARAMETRIC:**

The fundamental non-parametric approaches are information envelopment analysis (DEA) and free transfer structure (FDH). DEA utilizes scientific programming to develop a best practice outskirts from the watched information and to quantify productivity in respect to the built wilderness. The DEA does not require yield or yield costs for recognizing the best practice generation outskirts. It was first created by Charnes et al., (2014). The best practice outskirts was recognized as piece-wise straight mix that interfaces the arrangement of best practice perceptions, given the determinations of data sources and yields. The result was to create a raised generation outskirts for yield arranged DEA and inward creation boondocks for information situated DEA (Berger andHumphrey,2013). As an outcome, DEA effectiveness score for a basic leadership unit (DMU) was not characterized by a flat out standard but rather was characterized with respect to different structures. DEA produces an inside example proficiency score somewhere in the range of 0 and 1, with 1 being the most proficient. Afterward, Banker, Charnes, and Cooper (1984) stretched out CCR model to enable variable come back to scale. As of late Ray, Chen, and Mukherjee (RCM) (2008) presented a cost-minimization DEA demonstrate for a multi-plant firm that faces an alternate info costs vector ( $w_j$ ) at various plant areas ( $j=1,2,\dots,N$ ).

Under FDH approach, the supposition of convexity was dropped and it was relied upon to consider a superior guess of watched information and create bigger proficiency gauges than DEA. In any case, a critical preferred standpoint of DEA was that it doesn't superimpose a specific practical shape on the information in deciding the most proficient basic leadership units thus catches the transaction among sources of info and yields of various measurements. Then again, DEA's significant weakness was that it expect information to be free of estimation blunder and could, in this manner, give incorrect outcomes if the respectability of information was not guaranteed (Avkiran, 2013).

## 1.4 INVESTIGATIVE VIEW

A few systems have been proposed in the literature to gauge productivity utilizing boondocks approaches. Non-parametric methods, for example, DEA utilize straight programming procedures to process productivity scores. They don't require any presumptions with respect to the practical type of the outskirts, enabling the wilderness to firmly encompass the information. In any case, their primary shortcoming was that they don't take into account any blunder in the information. The whole separation to the outskirts was considered as wastefulness, bringing about the consideration of exogenous occasions in the wastefulness term. Wastefulness may then be overestimated. Besides, DEA has the real downside of expanding the quantity of productive perceptions of course when there was few a perception in respect to the quantity of data sources and yields. Parametric approaches, for example, the stochastic outskirts approach utilize econometric devices to assess the proficiency wilderness. Their principle shortcoming was that they force more structure on the state of the wilderness by indicating a useful frame for the cost work. Anyway their significant preference was that they take into account irregular blunder, which enhances the estimation of productivity scores. In any case, this recompense makes another issue: the division of arbitrary blunder from wastefulness. Parametric approaches at that point contrast in the method embraced to isolate irregular mistake from wastefulness. The stochastic boondocks approach utilizes a made blunder demonstrate in which wastefulness was accepted to pursue an awry conveyance (for example half-typical, truncated ordinary, gamma) while arbitrary mistake was accepted to pursue a symmetric circulation (generally ordinary). The basis was that wastefulness can't lessen expenses and hence should have an unbalanced conveyance, though irregular mistake can include or subtract cost and after that have a symmetric dispersion. Following

Jondrow et al., (2014) effectiveness was then figured by the contingent mean of the wastefulness term, given the leftover which was a gauge of the composite mistake. In this manner, the calculation of proficiency for the stochastic wilderness approach requires self-assertive presumptions in regards to the disseminations of the wastefulness term and arbitrary mistake.

Other parametric systems have been created, eminently to permit a division of irregular mistake from the wastefulness term without forcing presumptions on the disseminations of arbitrary blunder and the wastefulness term. Anyway their details don't permit their utilization in different works. The conveyance free approach requires board information, which are not accessible for an adequate period. The thick

wilderness approach just gives normal effectiveness scores to the entire tried example which may not be appropriate when examination was made between the productivity of residential possessed and outside claimed banks. At long last parametric approaches permit simpler control of the impact of factors on the structure of the cost wilderness than non-parametric strategies. Surely the incorporation of some ecological factors or the risk contrasts was effortlessly done by including terms in the evaluated cost boondocks (Mester,2012).

To total up, four approaches have come to overwhelm the literature on managing an account yield: the creation approach, the intermediation approach, the working (salary based) approach and all the more as of late, the cutting edge approach. There are five boondocks methods to gauge the overall productivity of banks. They are Stochastic Frontier Analysis (SFA), Distribution Free Approach (DFA), Thick Frontier Approach (TFA), Data Envelopment Analysis (DEA) and Free Disposal Hull (FDH). The initial three outskirts systems are parametric approach which requires express particular of creation boondocks like Cobb-Douglas and translog, and so forth. The staying two strategies are non-parametric approach which does not require a determination of generation boondocks and depended on numerical programming procedures. Among previously mentioned strategies, the most mainstream and generally utilized procedure in saving money effectiveness investigations is Data Envelopment Analysis (DEA). Scarcely any examinations have endeavored to think about various estimation strategies which found that decision made concerning effectiveness estimation more often than not have almost no effect which recommend that proficiency gauges are strong to various methodologies (Bauer et al., 2011).

## **1.6 EXACT REVIEWS**

### **1.6.1 Indian Experience**

Singh (2012) completed an extensive study to break down the patterns in the efficiency of the Indian managing an account industry. The State Bank of India and its auxiliaries alongside other nationalized banks were considered for analysis. He performed cross sectional and between worldly analyses based on 17 markers. The outcomes demonstrated that every one of the banks under study indicated enhancement in their profitability with the exception of the UCO bank, which indicated decrease in efficiency. One of the principal distributed examinations utilizing non-parametric creation wilderness approach was Noulas and Ketkar (2013) who utilized intermediation approach and decided the specialized and scale proficiency of open division banks for 2011. They discovered normal specialized

wastefulness of 3.75 percent, of which 66% was because of scale wastefulness. The study distinguished that unadulterated specialized effectiveness was 1.5 percent and scale wastefulness was 2.25 percent and none of the banks were working under diminishing comes back to scale.

Athma and Srinivas (2013) led a study to dissect the efficiency in business banks in India gather savvy (open part banks, private segment banks and outside banks) for the period 1982 to 1995. All the three bank bunches tried endeavors to enhance their efficiency in 1994– 95 and prevailing with regards to gaining benefits by recuperating the agent costs completely. The study reasoned that the productive tasks provoke recuperations, appropriate examination of credit risks and evasion of risky ventures are the way to benefit in keeping money. Das (2013) contemplated specialized, a locative and scale productivity of various open division banks for the period 2013– 17 utilizing DEA under intermediation approach. The efficiencies were determined for every year for every one of the banks. The study discovered decrease in general effectiveness after some time - decrease in specialized proficiency with slight enhancement in a locative productivity. Subsequently, change in wastefulness was because of specialized wastefulness rather a locative wastefulness. The State Bank was observed to be more effective than other open area banks. Das (2013) investigated the specialized and a locative effectiveness of 27 open segment banks utilizing cross-sectional information for the year 2012– 13. It was discovered that open segment banks had the extent of creating 1.23 occasions as much yield from similar data sources. Further, the wastefulness that showed up out in the open segment banks was more an aftereffect of both specialized and a locative wastefulness. The study found a negative connection between non-performing resources and proficiency and size and productivity.

Buddy et al., (2000) inspected the efficiency of 68 noteworthy Indian commercial banks for the year 1999. Yield arranged DEA demonstrate was utilized to locate the general proficiency of Indian banks. The outcomes demonstrated that 16 banks were CCR (steady come back to scale) proficient (productivity =1). The normal proficiency figure for the banks turned out as 0.9. Around 45 banks had effectiveness rating more prominent than 0.9 and out of these 50 percent were private banks. They presumed that the exclusive banks performed superior to the remote claimed banks. Sasha and Ravishankar (2013) evaluated profitability of 25 open part Indian commercial banks for the period 2012 to 2015 and analyzed the proficiency of people in general division banks in two stages utilizing transitional approach. The outcomes acquired demonstrated that the exhibitions of people in general division banks (except for the few) had enhanced over the study time frame. Syed (2011) connected

DEA method to examine saving money segment proficiency in the post change period of 1993– 98 utilizing intermediation approach. The example comprised of 37 banks out of which 18 were household possessed while 19 were remote claimed and tried for factor profitability development utilizing Malmquist efficiency file. The general normal wastefulness for the example of banks more than six-year time frame ended up being roughly 20 percent. The poor execution of managing an account part was because of poor execution of genuine segment, as opposed to the other way around.

Janki (2012) investigated the impact of innovation on the efficiency of workers utilizing DEA for the period 2012–14. The study found that open area banks had the most noteworthy productivity pursued by outside banks. The private banks were observed to be the minimum productive. They likewise found a worldly enhancement in the execution of outside banks. Nath et al., (2012) considered proficiency of 68 commercial banks working in India for the period 2011–12 utilizing DEA method. The outcome demonstrated that the private commercial banks have the higher proficiency figure and minimum variety though the outside claimed banks shows the slightest normal effectiveness figure and most extreme variety. The general population area commercial banks come in the middle. Kumbhakar and Sarkar (2013) broke down the connection among deregulation and aggregate factor profitability (TFP) development in the Indian managing an account industry utilizing a summed up shadow cost work approach. TFP development was deteriorated into innovative changes, scale and random segment. A disaggregated board information analysis utilizing the number of inhabitants openly and private banks over 1985– 96 which cover both pre and post-deregulation period demonstrated that with a noteworthy decrease in administrative and deregulation, the private area banks have enhanced their exhibitions for the most part because of the opportunity to grow yield while open segment banks have not reacted to the deregulation measures. Misra (2003) analyzed whether a locative productivity of the Indian saving money framework had enhanced after the presentation of budgetary division changes in the mid 1990s. Allocate productivity had been considered for 23 conditions of India for two periods 2009– 2012 and 2013– 2016, extensively relating to the pre and post-changes periods. The analysis conveyed under board co-reconciliation structure uncovered that generally speaking a locative productivity of the managing an account framework had nearly multiplied in the post-change period. Result proposed that while a locative productivity of bank's assets conveyed in the administrations segment had enhanced that in the agribusiness and industry had disintegrated in the post-change period for larger part of the states. Appraisals of flexibility of yield concerning credit enhanced from 0.30 amid the period 2012–2015 to 0.35 amid 1992– 201 showing as enhancement in the a locative effectiveness of the saving money

framework at the all India level.

Naidu and Nair (2003) inspected whether the specialized productivity of planned commercial banks in India had enhanced after the usage of Narasimham Committee proposals utilizing stochastic generation boondocks approach. The time of the study was 1988– 89 to 1990– 91 and 1991– 92 to 1998– 99. The outcome demonstrated that the specialized proficiency levels of open sector banks had recorded a decrease in the post-advancement period while the specialized effectiveness levels of both residential private and outside banks enhanced somewhat. The distinctions in the specialized effectiveness levels among bank bunches had declined in the post-advancement period showing upgraded rivalry among bank gatherings. Slam Mohan and Ray (2003) have contemplated profitability and proficiency of open and private sector banks in India, utilizing DEA, for the period 1992– 2000. They examined 27 open sector, 21 old private sector and 14 outside banks. They utilized three measures: Tornquist add up to factor profitability development, Malmquist proficiency file and income augmentation effectiveness. They accepted CRS innovation and utilized intermediation approach. Just outside banks demonstrated an enhancement in specialized proficiency while both open and private firms demonstrated a decay. Additionally the normal level of specialized productivity was essentially higher for remote banks (0.331 percent) contrasted with the PSBs (- 0.075 percent). They observed open sector banks to be progressively proficient and beneficial contrasted with their private sector rivals.

Shanmugam and Das (2014) separated the efficiency of 94 banks having a place with four particular belonging bundles in India in the midst of 2012–2014 using stochastic backwoods age appear. The dealing with a record industry had exhibited a headway to the extent capability of raising non-premium pay, adventures and credits. The adequacy upgrade was noteworthy by virtue of premiums in all banks particularly in private banks. Along these lines, the result matches with the fiscal improvement focus of the change measure. It was found that the State Bank gathering (48.7 – 51.4 percent) and outside banks (38.7– 41.3 percent) were more capable than their accomplices. Regardless, they found that there were up 'til now greater gaps between the certifiable and potential presentations of banks. Chakrabarti and Chawla (2015) associated DEA to survey the general capability of Indian banks in the midst of the period 2013– 2016. They utilized two models to decide input-yield vectors and named these models as "sum" and "regard" approaches. The outcomes of the study recommended that on the "regard" bases, the outside banks as a social occasion have been astonishingly more viable than all other bank groups sought after by the Indian private banks. In any case, from the "sum" perspective (volume of stores and

credit), private banks seem to do the best while the outside banks were the most detectably awful performers. Further, public sector banks have, in connection failed behind their private accomplices to the extent execution.

Das and Ghosh (2005) examined the capability and assessed the interrelationships among credit risk, capital and productivity change in the Indian setting, using the data on state-had banks (SOBs) for the period 2012– 14 to 2015– 17, where credit risk was evaluated by the extent of net non-performing advances to net advances. The results exhibited that higher productivity prompts a decrease in credit risk and besides there was a positive association among benefit and bank capitalization. This finding reinforced how poor performers were more disposed to risk taking than better performing dealing with a record affiliations. Das and Ray (2015) tentatively evaluated and explored diverse capability scores of Indian banks in the midst of 1997– 2003 using DEA. It was seen that Indian banks are so far next to no isolated in regards to information or yield masterminded specific capability and cost efficiency. In any case, they differentiate distinctly in respect of pay and advantage efficiencies. Obviously, salary rather than cost accepted a staggering activity in choosing advantage efficiency of Indian banks. Bank size, proprietorship, and being recorded on the stock exchange were a segment of the factors that emphatically influence ordinary advantage capability and somewhat, salary adequacy scores.

Uppal and Kaur (2017) broke down the productivity of all the bank groups in the post saving money sector changes time (2009– 2012 to 2014– 15). The example for the study involves five distinctive proprietorship groups and the proportion method was utilized to figure the productivity of various bank groups. The paper reasoned that the effectiveness of all the bank groups had expanded in the second post saving money sector changes period however these managing an account sector changes were progressively gainful for new private sector banks and outside banks. Omprakash et al., (2018) looked at the execution of the Indian managing an account sector in two phases: through the build of profitable effectiveness utilizing DEA and finding the determinants of gainful proficiency through TOBIT show for the period 2012– 2014. The study demonstrated that SBI and its gathering have the most astounding productivity: Indian Bank had appeared and steady increment in proficiency over the five years (0.6924 to 0.8444) trailed by private banks and the other nationalized banks. The outcomes were steady over the period, yet proficiency contrasts lessen over timeframe. The most imperative parameter for the yield proficiency was the working benefit per add up to resource (OPTA) trailed by the capital sufficiency proportion (CAR). Working benefit to add up to resources had a positive and critical impact on

productivity. The capital amplex proportion was found to have a huge positive effect on gainful effectiveness.

Paroma Sanyal and Rashmi Shankar (2018) broke down the impact of proprietorship and rivalry on bank efficiency while controlling for size and structure of the bank. They utilized an achievable GLS display controlling for bank explicit qualities and time settled impacts and registered four distinctive pieces of the pie dependent on aggregate salary of the bank, add up to resources claimed, credits and advances in addition to stores. They evaluated the measures dependent on the Herfindahl record. The study found that Indian private banks overwhelm people in general and outside banks, both as far as profitability levels and efficiency development and that challenge influences banks distinctively relying upon proprietorship. Sunil and Rachita (2018) dissected specialized, unadulterated specialized and scale efficiencies in Indian open sector (2012– 2015) utilizing calculated relapse analysis, slacks and targets setting analysis and Input-arranged productivity scores. The consequences of calculated relapse analysis gave that the elements like piece of the overall industry, gainfulness, and resource quality don't have any critical effect on the general specialized proficiency of Indian open sector managing an account industry.

Tianshu et al., (2018) utilizing a fair board informational collection covering the time of 2009– 2014, utilizing DEA based Malmquist add up to factor efficiency (TFP) record, analyzed the effect of administrative change on the execution of Indian commercial banks and whether it influenced the risk-taking conduct of market members. The experimental outcomes showed that, after an underlying change stage, the Indian keeping money industry experienced supported efficiency development, which was driven principally by mechanical advancement. Bank's proprietorship structure does not appear to issue as much as expanded challenge in TFP development. Remote banks seem to have gone about as mechanical trailblazers when rivalry expanded, which added to the aggressive weight in the managing an account showcase. At long last, results additionally demonstrated an expansion in risk-taking conduct alongside the entire deregulation process. Dash and Charles (2009) explored the specialized productivity of Indian banks utilizing DEA show divided as far as proprietorship amid the period 2013– 08 for an example of 41 noteworthy banks working in India. The consequences of the study demonstrated that remote banks were marginally more effective than open and private banks, and that there was very little of contrast in the productivity of open and private banks.

Buddy et al., (2009) directed study on profitability development of the Indian keeping money sector

utilizing board information for 63 commercial banks from 2012– 2015 utilizing DEA and deteriorate the Malmquist list of aggregate factor profitability development into specialized change, change in specialized effectiveness and change in scale productivity. The study uncovered that general profitability development was the consequence of specialized advancement joined by stagnating and negative development rate in the other segments of aggregate factor efficiency. Kumar and Gulati (2010) analyzed whether the impact of possession on the effectiveness of Indian local banks was noteworthy. The productivity scores for open and private sector banks were figured utilizing DEA for budgetary years 2015– 16 and 2016– 17. The study found that the new private sector banks overwhelm the development of effective boondocks of Indian household saving money industry, the general specialized wastefulness stems essentially from administrative wastefulness (as reflected by unadulterated specialized wastefulness) instead of scale wastefulness and however the proficiency contrasts between people in general and private sector banks have been noticed, these distinctions were factually unimportant in the greater part of the occasions. All in all, the study reasoned that possession does not make a difference in the Indian household managing an account industry.

Seema Sharma and Sanjeev Gupta (2010) endeavored to investigate the profitability and productivity development example of Indian managing an account industry amid the post-progression time by utilizing Malmquist information envelopment analysis (DEA) for the period 1996– 2006. Results demonstrated that amid the study time frame, the industry experienced relapse in mechanical advancement alongside stagnation in specialized productivity. Some advancement was accounted for in scale economies yet the commanding innovative relapse brought about efficiency decrease. From the gathering shrewd analysis, nationalized banks turned out to be the pioneer in the event of scale economies though private sector rose as the best entertainer in specialized effectiveness. None of the groups could encounter positive efficiency development over the study time frame. Suman Tandon (2010) endeavored to investigate the aggregate factor profitability changes of Indian open sector banks amid the post-changes period from 2011– 2017. A non parametric Malmquist profitability list was connected to figure efficiency. Add up to factor efficiency change (TFPCH) in execution of nationalized banks (with the exception of SBI and its partners) arrived at the midpoint of at 2.2 percent amid 1992– 93 to 2006– 07. The deterioration of TFPCH demonstrated that the mean specialized advancement expanded by 1.9 percent though mean specialized effectiveness had appeared peripheral increment of 0.3 percent amid the period. Though TFPCH in profitability of SBI and its partners was 2.1 percent, the adjustment in innovation was 3.8 percent and no change was seen in PECH. The adjustment in scale

productivity had demonstrated declining pattern of 0.7 percent.

Manas Kumar Baidya and Debabrata Mitra (2012) assessed the specialized proficiency of 26 Indian open sector banks from the cross-segment information for the budgetary year 2009– 2010 and positioned the productivity of the banks utilizing two well known DEA models: CCR and Andersen and Petersen's super-effectiveness display. The outcomes uncover that normal specialized proficiency of whole example was 86.5 percent and just seven banks (23 percent) were observed to be completely productive. The study found that, the banks which were utilizing more work for giving their administrations were generally progressively wasteful. State Bank of India was seen to be the most productive bank pursued by Indian Bank, Corporation Bank according to super-proficiency scores though most wasteful bank was United Bank of India. Arora and Arora (2013) analyzed year-to-year TFP changes experienced by Indian banks (open and private) in the post-progression period (1991– 1992 to 2007– 2008) utilizing H-M (Hicks-Moorsteen) list numbers. The fundamental finding of the study was that profitability (TFP) in Indian banks had stayed stale since 1991 to 1992 with no noteworthy contrasts saw in the three sub-time frames considered and sort of proprietorship significantly affected scale productivity in Indian banks.

Cheerful Puri and Yadav (2013) estimated the OTE (by and large specialized effectiveness), PTE (unadulterated specialized proficiency) and SE (scale productivity) of open sector and private sector banks for the year 2009 to 2010 utilizing DEA. The discoveries demonstrated that, open sector banks outflanked private sector banks in all classifications of efficiencies. The commitment of scale wastefulness in by and large specialized wastefulness had been seen to be littler than the commitment of unadulterated specialized wastefulness. The most elevated and least levels of normal by and large specialized wastefulness have been seen for old private sector banks (48.8 percent) and SBI and its Associates (2.2 percent), individually and the outcomes by affectability analysis are very powerful to segregate among effective and wasteful banks.

To whole up the greater part of concentrates that have inspected proficiency of saving money sector in India can be partitioned based on econometric methodologies into two, to be specific parametric and non parametric. Most scientists utilized DEA (information envelopment analysis) a non-parametric approach to gauge the aggregate profitability and productivity of banks. The vast majority of the early examinations found noteworthy enhancement in the proficiency scores of Indian commercial banks in the post-change period. Anyway clashing cases were progressed as to the execution of bank groups with

few examinations guaranteeing remote banks out performing Indian relies upon productivity score (Rajan et al., 2011; Uppal et al., 2011 and Kapil, 2007) while few others asserted residential banks to be preferable entertainer over outside banks (Rao, 2011 and Paroma Sanyal and Rashmi Shankar, 2008). In general, the study presumed that proprietorship does not make a difference in the Indian residential keeping money industry.

### **1.6.2 EXPERIENCE IN OTHER COUNTRIES**

Berg et al., (2013) inspected the adjustments in efficiency in managing an account industry for the period covering 2012- 2014 by taking an example of 346 banks in Norway. They presumed that the profitability declined on a normal before deregulation and efficiency had demonstrated expanding pattern after deregulation. Berg et al., (2012) utilized DEA to study the productivity in Scandinavian keeping money markets and found the normal Swedish bank (79 percent) to be more proficient than the normal Norwegian bank (57 percent), which thus, was more effective than the normal Finnish bank. Berger et al., (2012) analyzed the proficiency of banks in Norway, Sweden, and Finland, all of which allow general saving money. These information, in any case, for the most part cover U.S. banks and make no express qualification among general and non-all inclusive banks, found that bigger banks were increasingly proficient. In any case, since there were expansive inconsistencies between banks of comparable size, the study demonstrated that the manner in which singular banks were run was substantially more critical than their type of association or size, accordingly. Benston et al., (2013) demonstrate some favorable position for general banks over specific banks. In any case, taking into account that specific banks could get by in direct challenge with general banks, the creator yields that the productivity focal points of neither type of keeping money have all the earmarks of being overpowering.

Berger and Humphrey (2013) detailed that next to no of the interbank contrasts in proficiency scores was connected with potential corresponds, for example, measure, showcase focus and authoritative shape. In numerous occasions, factors that seem to have some illustrative power were not under the immediate control of supervisors. Griffel-Tatje and Lovell (2014) broke down the different reasons for efficiency change in Spanish saving money industry for the period 2008–2013 by utilizing Malmquist profitability Index. They presumed that commercial banks had bring down rate of efficiency development than sparing banks however these banks have higher rate of potential profitability

development. Paster et al., (2013), utilizing a non-parametric approach together with the Malmquist list, examined the distinctions in the profitability and productivity between various European and US keeping money framework. The study found that, under the supposition of a consistent comes back to scale creation innovation, France had the most noteworthy proficiency score of (0.95) and the UK had the least productivity score (0.56). Mendes and Rebello (2013) contemplated the Portuguese saving money sector identifying with profitability effectiveness, mechanical change and profitability and represented that deregulation in explicit case did not prompt an expansion in cost proficiency but instead to innovative relapse.

Wheelock and Wilson (2015) analyzing the specialized advancement, wastefulness and efficiency changes in US keeping money for the period 2016–2018 found that US commercial banks turned out to be progressively specialized wasteful somewhere in the range of 2012 and 2013. They utilized DEA (Shepherd yield remove work) for 14108 banks in 2011 and 11387 banks in 1993. The discoveries demonstrated that amid 2013–15 banks of all sizes experienced decrease in specialized productivity. However, there was mechanical advancement over the period for banks in every single size classification. Battese et al., (2009) broke down the effect of the deregulation on gainful productivity in Swedish saving money industry in mid–1980s utilizing stochastic outskirts approach with a particular of translog cost work to estimate the work use. The study distinguished that there were critical specialized wastefulness impacts for work use in banks and the general wastefulness was assessed to associate with 12 percent.

Lozano-Vivas et al., (2012) researched the working proficiency contrasts of an example of commercial banks crosswise over 10 European nations. They likewise viewed as stochastic wilderness approach (SFA) so as to check the consistency of the effectiveness results got in their base analysis. The normal change in their proficiency scores was around 12 percent. Belgium positioned in fourth place and Germany, France, Portugal and UK positioned similarly in fifth place regarding their normal natural conditions, demonstrate a comparable normal enhancement in their productivity scores, around 36 percent. Denmark and Spain which were positioned at the base, acquire an expansion of around 60 percent in their normal effectiveness score. The correlation between the two models demonstrates that nation explicit natural conditions practice a solid impact over the conduct of every nation's managing an account industry.

Yildirim (2012) broke down the productivity execution of Turkey commercial banks amid deregulated period by receiving DEA for the years 2009–2012. The analysis uncovered that the banks confronted diminishing comes back to scale and unadulterated specialized productivity and scale wastefulness were emphatically identified with size. In addition, the analysis saw that state-possessed banks performed superior to the private and remote banks. Canhoto and Dermine (2003) endeavored to appraise the extent of effectiveness gains in Portugal throughout the years 2011-2012, a time of critical money related deregulation following EU (European Union) enrollment. The DEA approach utilized in the study demonstrated an enhancement in proficiency for the general example after some time, with the new banks ruling the old ones as far as effectiveness. Casu and Molyneux (2013) researched whether there had been an enhancement in and union of gainful productivity crosswise over European keeping money markets since the making of the single inside market program (SMP) from 2012 to 2013. Utilizing proficiency estimates got from DEA estimation, the determinants of European bank effectiveness was assessed utilizing the Tobit relapse demonstrate approach. By and large, the outcomes propose that since the EU's SMP there had been a little enhancement in bank productivity levels, in spite of the fact that there was little proof to recommend that these have joined. The dominant part of DMUs containing the example appear to group around effectiveness levels of 0.65. The outcomes demonstrate that the effectiveness hole among nations became more extensive over the period.

The study led by Diego (2013) utilizing board estimation strategy to evaluate the components through which arrangement changes have impacted the development execution of 15 European Union economies likewise underpins the above propositions. He reached the resolution with the guide of two channels. First was the expansion in the level of money related intermediation estimated by the ascent in the private credit to GDP. The second divert was the enhancement in the quality and proficiency of the money related intermediation process peroxide by the fall in the development rate of the proportion of non-performing credits to add up to advances. The outcome uncovered that the harmonization procedure had affected development through the expansion in the level and productivity of money related intermediation. The advancement of capital controls had principally influenced development through enhancements in the level of proficiency in budgetary intermediation. Drakos (2013) utilized net premium edges as a marker of productivity demonstrated that the progress procedure had been viable in expanding proficiency in the managing an account frameworks of 11 change economies from the CEECs and Commonwealth of Independent States (CIS) more than 1993 and 1999. Moreover, he revealed that possession matters with state claimed banks setting the most reduced edges pursued by

remote banks. Isik and Hassan (2013) utilizing a nonparametric approach in the principal organize, assessed five diverse productivity scores, to be specific cost (CE), a locative (AE), specialized (TE), unadulterated specialized (PTE) and scale efficiencies (SE), somewhere in the range of 1988 and 1996. In the second stage, utilizing summed up minimum square (GLS) and Tobit numerous relapses, clarified the distinctions in estimated productivity crosswise over different types of banks working in Turkey. They found that open and remote banks beat private banks as far as expense and specialized proficiency while, open banks overwhelm both regarding a locative effectiveness; bigger size was emphatically adversely connected with scale productivity, proposing that ongoing development arrangements of medium and huge banks in Turkey were conflicting with cost minimization and saves money with a progressively taught work drive were more cost proficient. Resource development was contrarily connected with cost proficiency.

Robert M. Webb (2013) used DEA window analysis so as to research the relative productivity levels of substantial UK retail banks amid the time of progress 2012–2014. He found that for the whole example, the mean wastefulness levels were low in contrast with past investigations, that the generally speaking long run normal productivity slant was falling and that all banks in the study demonstrated diminished levels of proficiency over the whole study time frame. The study additionally discovered that scale wasteful aspects rule unadulterated specialized wasteful aspects. Ataullah et al., (2014) thought about the specialized effectiveness of commercial banks in India and Pakistan by utilizing DEA for the period 2012– 2015. The study recognized that after 2012– 2013 the general specialized productivity of the keeping money in the two nations moved forward. In India, effectiveness expanded because of enhancement in both unadulterated specialized proficiency and scale productivity while in Pakistan it was because of an enhancement in scale proficiency. The analysis uncovered that a hole in proficiency was because of high non-performing advances and monetary changes shut the productivity hole among expansive and little banks. Weill (2014) inspected the consistency of effectiveness outskirts method on European keeping money tests somewhere in the range of 1992 and 1998. He watched an absence of heartiness among these approaches. The mean productivity went between 80– 90 percent.

Grazyna (2008) in his article displayed the consequences of proficiency analysis registered by the two methods, for example utilizing the traditional monetary markers and the non-parametric DEA method. The analysis was done on commercial banks working in Poland covering the years 2000– 2007. The ROA, ROE and ROS proportions were utilized to assess the productivity of bank's performance. The

outcomes accomplished by the two methods demonstrated an expansion of the proficiency of bank's execution as of late. Bruce (2009) analyzed the thought of cockeyed sheet (OBS) exercises on saving money effectiveness and efficiency exhibitions inside the UAE managing an account sector. The study saw that in spite of generally speaking developing benefits and expanding all out factor efficiency (TFP) change in the United Arab Emirates managing an account sector, there was confirmations of over-keeping money and wastefulness by the sector in general and a few banks specifically. The incorporation of OBS exercises builds effectiveness scores and assessed efficiency levels for most banks, fortifying the overarching view that the prohibition of non-traditional exercises prompts a misspecification of bank's yield. Fadzlan (2009) utilizing the Malmquist efficiency list (MPI) method, endeavored to look at the effect of OBS things on Chinese bank's TFP. The outcomes proposed that state-claimed commercial banks, joint stock commercial banks and city commercial banks have displayed bring down TFP change (TFPCH) levels with the consideration of OBS things. The study found that state-claimed and city commercial banks have shown bring down TFPCH because of innovative change (TECHCH), while joint stock commercial banks have displayed bring down TFPCH because of specialized proficiency change (EFFCH).

Fadzlan (2010) endeavored to experimentally examine the Malaysian managing an account sector's profitability amid the period 1995– 2004. The observational discoveries proposed that the Malaysian saving money sector had displayed profitability relapse amid the period under study for the most part because of innovative relapse instead of proficiency decrease. The outcomes proposed that the local bank's profitability were relatively stale while the remote banks have shown efficiency decrease. The connection between various bank size and profitability demonstrates that the greater part of Malaysian banks which experienced efficiency development were the medium and substantial bank groups while the larger part of banks that accomplished profitability relapse had a place with the little bank groups. Fadzlan (2010) applying the non-parametric MPI method, endeavored to explore the wellsprings of profitability changes of China's state-claimed and joint-stock commercial banks (JSCBs) amid the period 2009– 2015. The experimental discoveries proposed that the China's managing an account sector had shown profitability advance credited to the expansion in proficiency. The second stage multivariate relapse results propose that benefit, salary enhancement, capitalization and advance force prompts a larger amount of aggregate factor profitability, innovative change and effectiveness, while risk was adversely identified with the bank's mechanical change levels. Fadzlan (2010) analyzed the wellsprings of aggregate figure efficiency the Thailand keeping money sector amid 2012– 2018. The study utilized

the yield arranged MPI to disconnect endeavors to get up to speed to the outskirts (proficiency change (EFFCH)) from movements in the boondocks (mechanical change (TECHCH)). The study investigated fundamental wellsprings of EFFCH: either upgrades in the board rehearses (unadulterated specialized effectiveness change) or ideal size (scale proficiency change). The discoveries showed that most of the medium banks (MED\_BNKS) and vast banks have displayed profitability development, while most of the little banks have encountered efficiency relapse. Zohra Jabeen (2010) estimated effectiveness of 14 chose banks in the monetary sector of Pakistan. The study utilized the parametric OLS procedure and chose the factors from the CAMEL rating framework and connected DEA approach to the example and evaluated their relative effectiveness regarding sources of info and yields of the intermediation approach. The study concluded from the aftereffects of the OLS method that the CAMEL proportions do endeavor to check the proficiency proportions of the example under contemplations. Inside the five autonomous factors, the CAR and income have significant consistency.

Fadzlan (2011) utilized the MPI method to break down the effect of risks on China bank's aggregate factor profitability. The outcomes show that the China managing an account sector had displayed a lower add up to factor profitability change (TFPCH) with the incorporation of risk factor. The joint stock commercial banks and city commercial banks have shown bring down TFPCH inferable from mechanical change (TECHCH), while the state claimed commercial banks have displayed bring down TFPCH attributable to specialized productivity change (EFFCH). Gurcharan Singh and Sukhmani (2011) examined efficiency and gainfulness for a time of nine years (2011– 2013). It was discovered that gainfulness in all chose DCCBs of Punjab had appeared negative pattern while the profitability enhanced significantly over the time of study. The stores per representative (10.76 percent) and per branch (9.24 percent), credits per worker (12.05 percent), per branch (10.51 percent), business per worker (11.52 percent) and per branch (9.98 percent) enlisted significant increments in normal productivity of DCCBs in Punjab. Net benefit in connection to claim reserves demonstrated a significant decrease at the rate of 8.83 percent while the decrease in net benefit in connection to business was observed to be insignificant. Fred et al., (2011) built up a multivariate discriminant model to separate between low proficiency and high effectiveness network banks (US) (under \$1 billion in all out resources) in light of the productivity proportion, an ordinarily utilized money related execution measure that relates non-premium costs to add up to working pay. The discriminant show was tried utilizing information for 2006– 2008. This incorporates times of superior and in addition falling apart industry conditions related with the current money related emergency. The mean ROA for low proficiency banks

extends between – .29 to .33 percent while the ROA for high effectiveness banks ranges from 1.0 to 1.73 percent. An essential factor influencing productivity was the proportion of pay rates and benefits to average resources (SalAA). Low productivity banks have a normal SalAA proportion as high as 2.36 percent in 2007 which was generously higher than the 1.29 percent for high proficiency banks in 2006. For resource quality low effectiveness banks have an estimation of around 65 percent while high proficiency banks were even lower at 23 percent. The study found that model's characterization precision ranges from around 88 percent to 96 percent for both unique and cross-approval datasets.

To entirety up however household and outside examinations pursue diverse innovation and keeping money rehearses, the relative normal inductions of the study was the positive effect of deregulatory strategies on the effectiveness and profitability of banks while the proprietorship impact on the proficiency of banks was uncertain. The vast majority of the investigations have utilized DEA examinations for estimating the proficiency of the keeping money framework. The vast majority of the examinations discovered enhancements in effectiveness all through the whole deregulatory period and that country– explicit natural conditions practice a solid impact over the conduct of saving money industry in various nations.

## **1.7 CONCLUSION**

Essential ideas for estimation of specialized productivity of a firm in an industry by assessing generation capacity of firms, which are completely proficient (for example wilderness creation work) was proposed by Farrell (2012). His definition of the effective firm is "its accomplishment in creating as vast as conceivable a yield from a given arrangement of sources of info". He characterizes specialized effectiveness as an association's achievement in creating most extreme yield from a given arrangement of sources of info, i.e., delivering on the specialized boondocks. The generation capacity can be accessed from test information utilizing either a nonparametric (numerical programming) or a parametric (econometric) approach. Specialized effectiveness is assessed by the unit's separation from the (best practice) creation boondocks. Rogowski (2011) marks that there are two proportions of specialized productivity, which are principally utilized in the literature: yield situated and input-arranged specialized effectiveness. Info situated specialized effectiveness or X-proficiency alludes to choosing the suitable sources of info, for example the ideal scale and blend of sources of info, given the yield package. A standout amongst the most well-known estimates connected is cost X-effectiveness. In yield arranged

specialized proficiency the emphasis is on expanding yield without changing the sources of info utilized. It is, among others, utilized for income analysis.

## REFERENCES

1. BHADRAPPA HARALAYYA , P.S.AITHAL , PERFORMANCE AFFECTING FACTORS OF INDIAN BANKING SECTOR: AN EMPIRICAL ANALYSIS, George Washington International Law Review, Vol.- 07 Issue -01, April-June 2021, PAGE No : 607-621.
2. BHADRAPPA HARALAYYA , P.S.AITHAL , TECHNICAL EFFICIENCY AFFECTING FACTORS IN INDIAN BANKING SECTOR: AN EMPIRICAL ANALYSIS, Turkish Online Journal of Qualitative Inquiry (TOJQI), Vol.- 12 Issue -03, June 2021, PAGE No : 603-620,
3. BHADRAPPA HARALAYYA , P.S.AITHAL , IMPLICATIONS OF BANKING SECTOR ON ECONOMIC DEVELOPMENT IN INDIA, George Washington International Law Review, Vol.- 07 Issue -01, April-June 2021, PAGE No : 631-642
4. BHADRAPPA HARALAYYA , P.S.AITHAL ,STUDY ON PRODUCTIVE EFFICIENCY OF BANKS IN DEVELOPING COUNTRY, International Research Journal of Humanities and Interdisciplinary Studies ([www.irjhis.com](http://www.irjhis.com)) ,Volume: 2, Issue: 5, May 2021, Page No : 184-194.
5. Bhadrappa Haralayya ; P. S. Aithal . "Study on Model and Camel Analysis of Banking" Iconic Research And Engineering Journals ,Volume 4 ,Issue 11 ,May 2021 Page 244-259.
6. Bhadrappa Haralayya and Aithal, P. S.. “Analysis of cost efficiency on scheduled commercial banks in India”. International Journal of Current Research, Volume 13, Issue 06, June 2021, pp 17718-17725
7. Bhadrappa Haralayya and P. S. Aithal, “A Study On Structure and Growth of Banking Industry in India”, International Journal of Research in Engineering, Science and Management ,Volume 4, Issue 5, May 2021. Page no 225–230.
8. Bhadrappa Haralayya, Retail Banking Trends in India ,International Journal of All Research Education and Scientific Methods (IJARESM), Volume: 9, Issue: 5, Year: May 2021, Page No : 3730-3732.
9. BHADRAPPA HARALAYYA, P.S.AITHAL, FACTORS DETERMINING THE EFFICIENCY IN INDIAN BANKING SECTOR : A TOBIT REGRESSION ANALYSIS", International Journal of Science & Engineering Development Research ([www.ijedr.org](http://www.ijedr.org)), Vol.6, Issue 6, June-2021, page no.1 - 6, ,
10. BHADRAPPA HARALAYYA , P.S.AITHAL , IMPLICATIONS OF BANKING SECTOR ON ECONOMIC DEVELOPMENT IN INDIA, flusserstudies, Volume 30, June 2021,Page No:1068-1080,
11. BHADRAPPA HARALAYYA, P.S.AITHAL, STUDY ON PRODUCTIVE EFFICIENCY OF FINANCIAL INSTITUTIONS, International Journal of Innovative Research in Technology, Volume 8, Issue 1, June-2021 ,Page no: 159 – 164,
12. BHADRAPPA HARALAYYA , STUDY OF BANKING SERVICES PROVIDED BY BANKS IN

13. BHADRAPPA HARALAYYA, P.S.AITHAL , ANALYSIS OF BANK PERFORMANCE USING CAMEL APPROACH", International Journal of Emerging Technologies and Innovative Research ([www.jetir.org](http://www.jetir.org) | UGC and issn Approved), Vol.8, Issue 5, May-2021, page no 305-314,
14. BHADRAPPA HARALAYYA, P.S.AITHAL, ANALYSIS OF BANK PRODUCTIVITY USING PANEL CAUSALITY TEST, Journal of Huazhong University of Science and Technology, Volume 50, Issue 6, June-2021 , Page no: 1 – 16,
15. BHADRAPPA HARALAYYA, P.S.AITHAL, INTER BANK ANALYSIS OF COST EFFICIENCY USING MEAN, International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET), Volume 10, Issue 6, June-2021 ,Page no: 6391-6397,
16. BHADRAPPA HARALAYYA, P.S.AITHAL , ANALYSIS OF TOTAL FACTOR PRODUCTIVITY AND PROFITABILITY MATRIX OF BANKS BY HMTFP AND FPTFP, Science, Technology and Development Journal, Volume 10, Issue 6, June-2021, Page no: 190-203, Available at: <http://journalstd.com/gallery/23-june2021.pdf>
17. BHADRAPPA HARALAYYA, P.S.AITHAL , ANALYSIS OF BANKS TOTAL FACTOR PRODUCTIVITY BY AGGREGATE LEVEL, Journal of Xi'an University of Architecture & Technology, Volume 13, Issue 6, June- 2021 ,Page no: 296-314,
18. Bhadrappa Haralayya, P S Aithal, "ANALYSIS OF BANKS TOTAL FACTOR PRODUCTIVITY BY DISAGGREGATE LEVEL", International Journal of Creative Research Thoughts (IJCRT), Volume.9, Issue 6, June 2021, pp.b488-b502,
19. Haralayya B. Importance of CRM in Banking and Financial Sectors Journal of Advanced Research in Quality Control and Management 2021, 6(1): 8-9
20. Haralayya B. How Digital Banking has Brought Innovative Products and Services to India. Journal of Advanced Research in Quality Control and Management 2021; 6(1): 16-18
21. Haralayya B. Top 5 Priorities That will Shape The Future of Retail Banking Industry in India. Journal of Advanced Research in HR and Organizational Management 2021; 8(1&2): 17-18.
22. Haralayya B. Millennials and Mobile-Savvy Consumers are Driving a Huge Shift in The Retail Banking Industry. Journal of Advanced Research in Operational and Marketing Management 2021; 4(1): 17-19
23. Haralayya B. Core Banking Technology and Its Top 6 Implementation Challenges. Journal of Advanced Research in Operational and Marketing Management 2021; 4(1): 25-27
24. Nitesh S Vibhute ; Dr. Chandrakant B. Jewargi ; Dr. Bhadrappa Haralayya . "Study on Non-Performing Assets of Public Sector Banks" Iconic Research And Engineering Journals Volume 4, Issue, 12 June 2021, Page 52-61

25. Haralayya, Dr. Bhadrappa and Saini, Shrawan Kumar, An Overview on Productive Efficiency of Banks & Financial Institution (2018). International Journal of Research, Volume 05 Issue 12, April 2018.
26. Haralayya, Dr. Bhadrappa, Review on the Productive Efficiency of Banks in Developing Country (2018). Journal for Studies in Management and Planning, Volume 04 Issue 05, April 2018,
27. Haralayya, Dr. Bhadrappa, The Productive Efficiency of Banks in Developing Country With Special Reference to Banks & Financial Institution (april 30, 2019).
28. Haralayya, Dr. Bhadrappa, Study on Performance of Foreign Banks in India (APRIL 2, 2016).
29. Haralayya, Dr. Bhadrappa, E-Finance and the Financial Services Industry (MARCH 28, 2014).
30. Haralayya, Dr. Bhadrappa, E-payment - An Overview (MARCH 28, 2014).
31. Bhadrappa Haralayya . "Customer Satisfaction at M/s Sindol Bajaj Bidar" Iconic Research And Engineering Journals, Volume 4 ,Issue 12, June 2021, Page 157-169
32. Bhadrappa Haralayya . "Ratio Analysis at NSSK, Bidar" Iconic Research And Engineering Journals, Volume 4, Issue 12,June 2021, Page 170-182
33. Bhadrappa Haralayya . "Financial Statement Analysis of Shri Ram City Union Finance" Iconic Research And Engineering Journals, Volume 4, Issue 12,June 2021, Page 183-196
34. Bhadrappa Haralayya . "Employee Job Satisfaction at Big Bazaar" Iconic Research And Engineering Journals, Volume 4, Issue 12, June 2021, Page 197-206
35. Bhadrappa Haralayya . "Effect of Branding on Consumer Buying Behaviour at Vijay Bharat Motors Pvt Ltd, Bidar" Iconic Research And Engineering Journals, Volume 4, Issue 12, June 2021, Page 207-222
36. Bhadrappa Haralayya . "Study on Customer Perceptions Guru Basava Motors, Bidar" Iconic Research And Engineering Journals, Volume 4, Issue 12,June 2021, Page 223-231
37. Bhadrappa Haralayya . "Study on Loans and Advances for DCC Bank Main Branch Nayakaman, Bidar" Iconic Research And Engineering Journals, Volume 4, Issue 12, June 2021, Page 232-242
38. Bhadrappa Haralayya . "Work Life Balance of Employees at Karanja Industries Pvt Ltd, Bidar" Iconic Research And Engineering Journals, Volume 4, Issue 12, June 2021, Page 243-254
39. Bhadrappa Haralayya . "Working Capital Management at TVS Motors, Bidar" Iconic Research And Engineering Journals, Volume 4, Issue 12, June 2021, Page 255-265
40. Haralayya, Dr. Bhadrappa, Testing Weak Form Efficiency of Indian Stock Market – An Empirical Study on NSE (April 30, 2021). Emerging Global Strategies for Indian Industry (ISBN: 978-81-910118-7-6), 2021,
41. Bhadrappa Haralayya . "Advertising Effectiveness With Reference to Big Bazaar" Iconic Research And Engineering Journals, Volume 5, Issue 1, July 2021, Page 101-110
42. Bhadrappa Haralayya . "Analysis of Non Performing Asset on Urban Cooperative Bank in India" Iconic Research And Engineering Journals, Volume 5, Issue 1,July 2021, Page 111-121
43. Bhadrappa Haralayya . "Ration Analysis With Reference to DCC Bank" Iconic Research And Engineering

Journals, Volume 5, Issue 1, July 2021, Page 122-130

44. Bhadrappa Haralayya . "Consumer Buying Behavior With Reference to Bajaj Auto Ltd" Iconic Research And Engineering Journals, Volume 5, Issue 1, July 2021, Page 131-140
45. Bhadrappa Haralayya . "Sales Promotion With Reference to Yamaha Motor" Iconic Research And Engineering Journals, Volume 5, Issue 1, July 2021, Page 141-149
46. Bhadrappa Haralayya . "Financial Statement Analysis Using Common Size on Mahindra Sindol Motors" Iconic Research And Engineering Journals, Volume 5, Issue 1, July 2021 , Page 150-159
47. Bhadrappa Haralayya . "Loans And Advances with Reference to PKGB Bank" Iconic Research And Engineering Journals, Volume 5, Issue 1, July 2021, Page 160-170
48. Bhadrappa Haralayya . "Study on Trend Analysis at John Deere" Iconic Research And Engineering Journals, Volume 5, Issue 1, July 2021, Page 171-181
49. Haralayya B, Aithal PS. Study on Cost Efficiency in Indian and Other Countries Experience. Journal of Advanced Research in HR and Organizational Management 2021; 8(1&2): 23-30.
50. Haralayya B, Aithal PS. Study on Theoretical Foundations of Bank Efficiency. . Journal of Advanced Research in Operational and Marketing Management 2021; 4(2): 12-23.
51. Haralayya B, Aithal PS. Study on Profitability Efficiency in Indian and Other Countries Experience. Journal of Advanced Research in Quality Control and Management 2021; 6(2): 1-10.
52. S. Vinoth, Hari Leela Vemula, Bhadrappa Haralayya, Pradeep Mamgain, Mohammed Faez Hasan, Mohd Naved, Application of cloud computing in banking and e-commerce and related security threats, Materials Today: Proceedings, 2021,ISSN 2214-7853, <https://doi.org/10.1016/j.matpr.2021.11.121>(<https://www.sciencedirect.com/science/article/pii/S2214785321071285>).
53. Haralayya B, Jeelan BV, Vibhute NS. Capital Structure and Factors Affecting Capital Structure. J Adv Res Eco Busi Mgmt 2021; 4(2): 4-35.
54. Vibhute NS, Haralayya B, Jeelan BV. Performance Evaluation of Selected Banks using Ratio Analysis. J Adv Res Eco Busi Mgmt 2021; 4(2): 36-44
55. Jeelan BV, Haralayya B, Vibhute NS. A Study on Empirical Analysis of Relationship between FPI and NIFTY Returns. J Adv Res Acct Fin Mgmt 2021; 3(2): 3-22
56. Jeelan BV, Haralayya B, Vibhute NS. A Study on Performance Evaluation of Initial Public Offering (IPO). J Adv Res Pub Poli Admn 2021; 3(2): 12-26.
57. Basha VJ, Haralayya B, Vibhute NS. Analysis of Segment Reporting with Reference to Selected Software Companies. J Adv Res Entrep Innov SMES Mgmt 2021; 4(2): 9-26.
58. Jeelan BV, Haralayya B, Vibhute NS. Co-Movement and Integration among Stock Markets: A Study of 10 Countries. J Adv Res Acct Fin Mgmt 2021; 3(2): 23-38.

59. Jeelan BV, Haralayya B, Vibhute NS. A Comparative Study on Selected Foreign Currencies. J Adv Res Eco Busi Mgmt 2021; 4(2): 45-5
60. Bhadrappa Haralayya . "A Study on Customer Satisfaction at TVS Vanish Motors Bidar" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 117-127
61. Bhadrappa Haralayya . "Consumer Buying Behavior at Kailash Motors Bidar" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 128-137
62. Bhadrappa Haralayya . "Credit Risk of Canara Bank Bidar" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 138-149
63. Bhadrappa Haralayya . "Effect of Branding on Consumer Buying Behaviour in Bharat Ford Bidar" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 150-159
64. Bhadrappa Haralayya . "Employee Engagement at Kharanja Industry Pvt Ltd Humanbad" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 160-170
65. Bhadrappa Haralayya . "Employee Performance Appraisal at Sri Veerabhadreshwar Motors Bidar" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 171-183
66. Bhadrappa Haralayya . "Employees Training and Development at Mgssk Ltd Bhalki" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 184-196
67. Bhadrappa Haralayya . "Impact of Financial Statement Analysis on Financial Performance in Lahoti Motors Bidar" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 197-206
68. Bhadrappa Haralayya . "Impact of Ratio Analysis on Financial Performance in Royal Enfield (Bhavani Motors) Bidar" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 207-222
69. Bhadrappa Haralayya . "Sales Promotion at Keshva Enterprise Bidar" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 223-232
70. Bhadrappa Haralayya . "The Impact of Safety and Health Measures of Employees at KJD Pharma Bidar" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 233-242
71. Bhadrappa Haralayya . "Comparative Analysis of Mutual Funds in Geojit Financial Services Ltd Gulbarga" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 243-251
72. Bhadrappa Haralayya . "Cost Analysis at MGSSK Bhalki" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 252-258
73. Bhadrappa Haralayya . "Employee Compensation Management at Vani Organic Pvt Ltd Bidar" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 259-266
74. Bhadrappa Haralayya . "Employees Performance Appraisal of Chettinad Cement Gulbarga" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 267-277
75. Bhadrappa Haralayya . "Ratio Analysis in Muthoot Finance Ltd Aurad" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 278-284

76. Bhadrappa Haralayya . "Study on Promotion Mix Strategy Towards Big Bazaar Bidar" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 285-291
77. Bhadrappa Haralayya . "Study on Sales Promotion Techniques Used by VKG Bajaj at Kalaburagi" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 292-298
78. Bhadrappa Haralayya . "Working Capital Management in Hyundai Showroom Bidar" Iconic Research And Engineering Journals Volume 5 Issue 9 2022 Page 299-308
79. Bhadrappa Haralayya "Study on Performance Evaluation of Mutual Funds" Iconic Research And Engineering Journals Volume 5 Issue 10 2022 Page 29-36
80. Bhadrappa Haralayya . "The Performance of Mutual Fund Schemes in The Framework of Risk and Return" Iconic Research And Engineering Journals Volume 5 Issue 10 2022 Page 37-44
81. Bhadrappa Haralayya . "Risk And Return Analysis of Mutual Funds with Reference to Banks" Iconic Research And Engineering Journals Volume 5 Issue 10 2022 Page 45-55
82. Bhadrappa Haralayya . "Comparative Study on Performance Evaluation of Mutual Funds with Reference to Banking Funds" Iconic Research And Engineering Journals Volume 5 Issue 10 2022 Page 56-64